ACC NR: AP7001703

SOURCE CODE: UR/0032/66/032/012/1523/1525

AUTHOR: Kogan, M. G.; Andreychenko, I. T.; Bogin, V. S.; Zavartsev, N. A.; Karker, Ya. I.

ORG: none

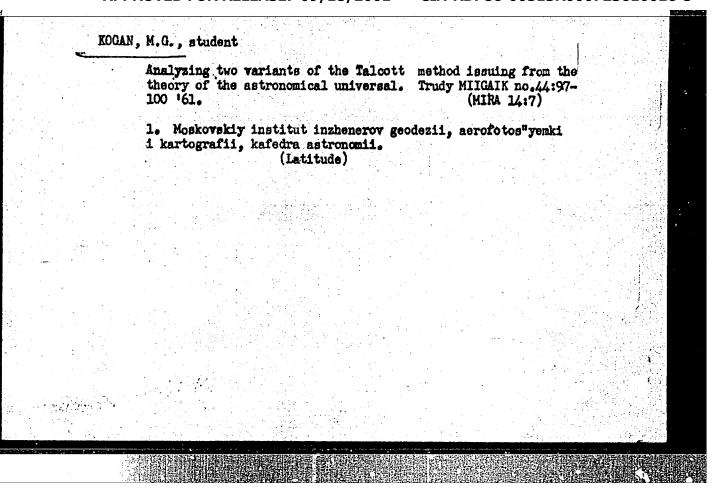
TITLE: Laboratory high-temperature furnace for heating and melting of metals

SOURCE: Zavodskaya laboratoriya, v. 32, no. 12, 1966, 1523-1525

TOPIC TAGS: metalluric research, metallurgic furnace, high temperature furnace, electron beam furnace

ABSTRACT: A laboratory vacuum furnace for heating, melting, zone refining, and evaporating (for vacuum-vapor deposition) primarily refractory metals has been designed and built at an unidentified institution. The furnace operates with several heating systems (resistance, radiation, arc, and electron beam) used individually or in combination. The vacuum chamber can be evacuated to a pressure of 10-6 mm Hg: The furnace produces ingots 50 mm in diameter and up to 400 mm long. The charge can be placed in advance or fed during the melting. Zone refining can be done with a metal bar in the horizontal or vertical position. In vacuum-vapor deposition, the evaporation is done with an electron beam, and the temperature of the substrate is controlled with radiant heat. The furnace has two 45-kw electron guns operating with an accelerating voltage of 30 kv. Orig. art. has: 1 figure. SUB CODE: 13/ SUBM DATE: none/ ATD PRESS: 5111 Card 1/1

UDC: 621.365:621,52:546.3



"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723610016-5

32161-66 EWT(1) ACC NR: AP6010065 SOURCE CODE: UR/0387/66/000/003/0063/0073 AUTHOR: Kuzivanov, V. A.; Kogan, H. G.; Magnitskaya, Ye. I. В ORG: Institute of Physics of the Earth, Academy of Sciences, SSSR (Institut fiziki Zemli, Akademii nauk SSSR) TITLE: The effect of horizontal and vertical acceleration on the readings of a strongly damped gravimeter SOURCE: AN SSSR. Izvestiya. Fizika Zemli, no. 3, 1966, 63-73 TOPIC TAGS: gyrostabilized platform, accelerometen; gravimeter, ACCELERATION EFFECT ABSTRACT: A study was made of the effect of horizontal and vertical accelerations on the readings of a pendulum-type gravity meter, mounted on an ideal gyrostabilized platform in an ideal universal joint. The resulting cross-coupling effect was analyzed theoretically, the parameters being related by the differential equation: $\ddot{s} + 2\lambda \dot{s} + \left(n^2 + \dot{\gamma}^2 - \frac{\ddot{X}}{l}\right) \dot{s} = + \frac{g_r}{l} + \frac{\ddot{Z}}{l}.$ where ε is the angle of deviation of the pendulum from the horizontal, X is the hori-UDC: 550.831 Card 1/2

L 32161-66

ACC NR: AP6010065

zontal acceleration, n is the natural frequency of the pendulum gravimeter, λ is the damping characteristic, l is the reduced pendulum length and γ is the angular velocity of the support along the Z axis. A solution of this equation was derived of the form

8 == E0 + BEO,

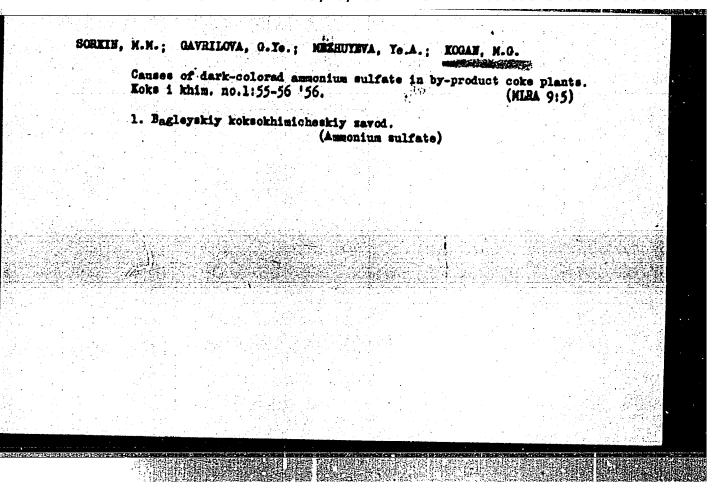
where co is the solution of the 'abridged' equation:

$$2\lambda \dot{e}_0 + \left(n^{\frac{1}{4}} - \frac{\dot{X}}{l} + \dot{\gamma}^2\right) s_0 = + \frac{g_r}{l} + \frac{\ddot{Z}}{l}.$$

The solution of ϵ_0 was an expanded integral equation while that of ϵ was an infinite trigonometric series. The magnitude of the cross-coupling effect was estimated by inserting numerical values for the above parameters and variables; for $\ddot{X}\approx\ddot{Z}\approx50$ gal this effect reached 50 mgl and higher. The orbital acceleration was calculated at 125 mgal for $\ddot{X}=\ddot{Z}=50$ gal and $\omega=1$ sec 1. Formulas were also derived for the changes in gravitational field with time using the same parameters. Numerically, this was calculated to be 1.4 mgl for 2g/2x=10 mgl/mile, $n^2=100$ sec 2 and $2\lambda=5000$ sec 1. Orig. art. has: 1 table, 63 formulas.

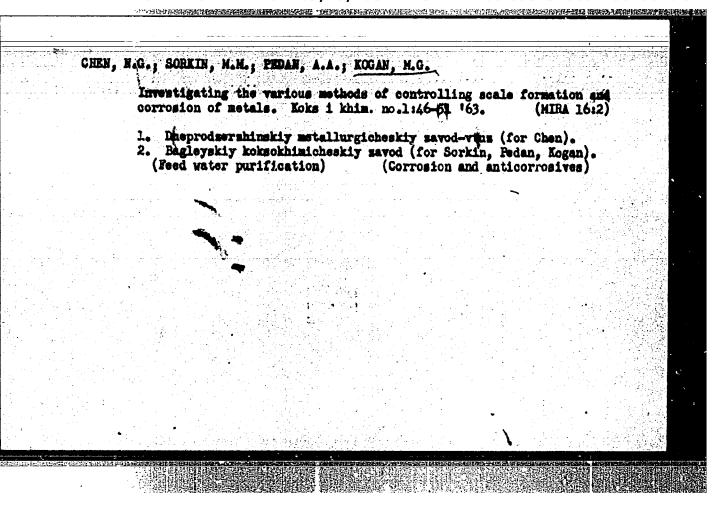
SUB CODE: 08/ SUBH DATE: 19Feb65/ ORIG REF: 003/ OTH REF: 001

Card 2/2 /



AYVĖIK	O, D.D.; PEDAN, A.A.; KOGAN, M.G.	
	Operations of the ammonia-lime section employing an and decnater. Koks i khim. no.2:30-32 161.	external saturator (MIRA 14:2)
	1. Bagleyskiy koksokhimicheskiy zavod. (Dneprodzerzhinsk—Coke industry—By-products)	(Ammonia)

SCRKIN, M.M.; PEDAN, A.A.; KOCAN, M.G. Recovery of benzene hydrocarbons from tar acid and the removal of the residue with the water of hydrosol removers, Koks i khim. no. 3:49-50 '61. (MIRA 14:4) 1. Bagleyskiy koksokhimicheskiy zavod. (Dneprodzershinsk—Coke industry—By-products) (Coal tar products)



S/068/63/000/001/003/004 E071/E136

AUTHORS:

Chen, N.G., Sorkin, M.M., Pedan, A.A., and

Kogan, M.G.

TITLE:

An investigation of various methods of combating the scale formation and corrosion of metal

PERIODICAL: Koks i khimiya, no.1, 1963, 46-57

TEXT: A comparative investigation of the effect of magnetic, phosphate and "coking works" methods of treatment of water used for cooling in heat exchangers was carried out in a laboratory. The "coking works" method of treatment of cooling water consists of adding to it the works phenolic effluent. This method was the most effective in preventing scale formation. The magnetic treatment decreases the corrosive action of the water only insignificantly. Moreover, an intense corrosion of metal was noticed in the sector of direct action of the magnetic field. Sodium phosphate in a concentration of 2 mg/litre (calc. as P2Og) does not inhibit corrosion, but in a mixture with calcium bicarbonate (10 mg - equiv/litre) has a protective influence. Phenolic water from the coking works has a particularly strong Card 1/2

An investigation of various ... \$/068/63/000/001/003/004 E071/E136

passivating effect on metal if it contains some creosote oil.

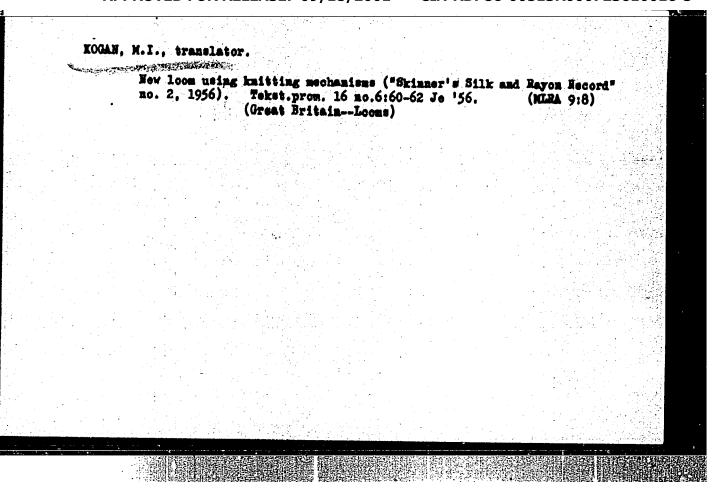
The presence of a large amount of tar in the water leads to the activation of metal.

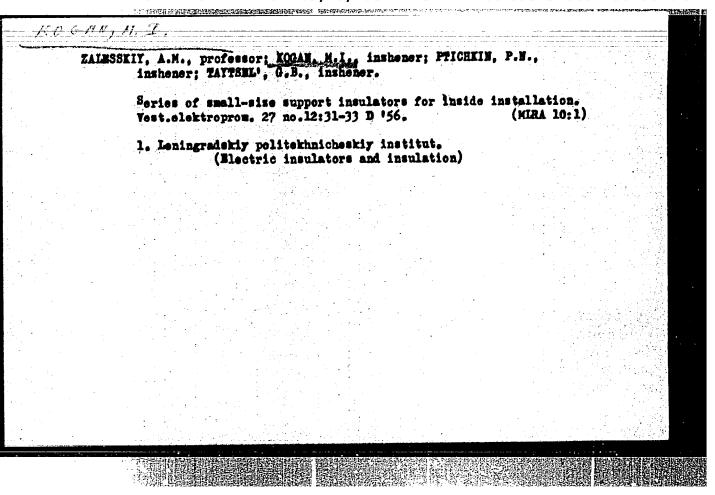
There are 2 figures and 2 to 1.

There are 2 figures and 2 tables.

ASSOCIATION: Dneprodzerzhinskiy metallurgicheskiy zavod-vtuz (Dneprodzerzhinsk Metallurgical Works - vtuz) (Chen, N.G.); Bagleyskiy koksokhimicheskiy zavod (Bagley Coking Works) (Sorkin, M.M., Pedan, A.A. and Kogan, M.G.).

Card 2/2



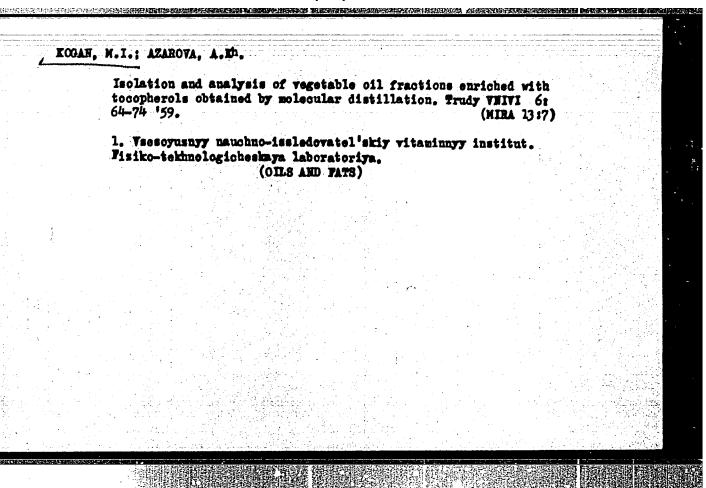


VAYHSHTEIH, Georgiy Mikhaylovich, Prinimali uchastiye: KOGAH, M.I. [translator]; PETUKHOV, V.P. [translator]. SLOBOREMA, G.M., red.; VELITSYN, B.L., tekhn.red.

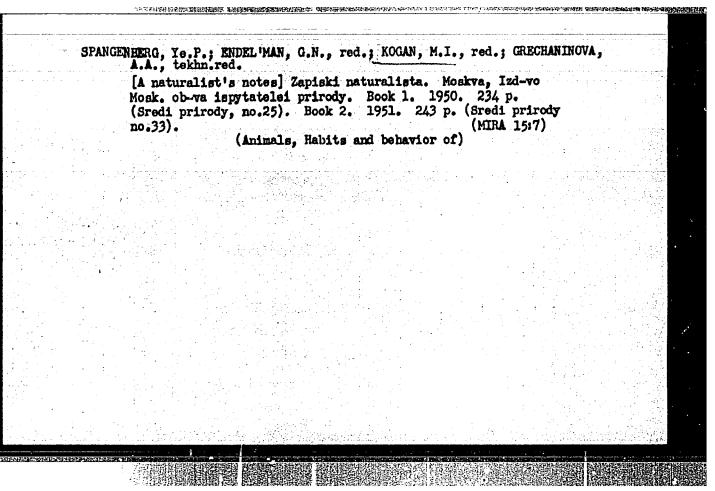
[Pneumatic-tube transportation of concrete] Transportirovanie betonnoi smesi po trubam pri pomoshchi sshatogo vosdukha.

Moskva, Organergostroi, 1957.. 23 p. (MIRA 12:3)

(Pneumatic-tube transportation) (Concrete)



Plastic components for textile machinery. no.2:28-32 F 160.	Tekst.prom. 20 (MIRA 13:6)	
1. Ispolnyayushchiy obyasannosti glavnogo l Tashtekstil'mash (for Zhuravskiy). 2. Each cheskogo otdela Spetsial'nogo konstruktors nogo mashinostroyeniya (for Kogan). (Plastics) (Textile machinery	kogo byuro tekstil	



[Ichthyophagous birds in the southern seas of the U.S.S.R. and their harmfulness] Ryboladnye ptitsy lushnyth morel SSSR i ith wred. Moskva, Isd-vo Mosk. ob-va ispytatelei prirody, 1951. 92 p. (Materialy k posmanifu famny i flory SSSR. Odel soologicheskii, no.30).

(Birds—Food) (Fisheries) (MIRA 1193)

ORHOHKIN, 7-Pe; BUKHOWYM, A.We, nauchnyy red.; KOGAN, Mela, prof., vedushchiy red.

[Studies on the biology of forest pests] Ocherki po biologii vrediteled; led, lesa, Moskva, Isd-vo Mosk, ob-va impytatelei prirody, 1951, 149 p. (Materialy k posnaniin fauny i flory SSSR, Otdel zoologicheskii, no.31).

(Forest insects)

8/081/62/000/016/022/043 B168/B186

AUTHORS:

Fedorova, R. V., Kogan, M. I., Belova, O. D.

method, 'II by reaction with dimedon, etc.), and that of gaseous products

TITLE:

Vapor-phase condensation of acetone with formaldehyde in

methylvinylketone. Summary

PERIODICAL:

Referativnyy zhurnal: Khimiya, no. 16, 1962, 384, abstract 16L11 (Tr. Vses. n.-i. vitamin. in-t, v. 7, 1961, 54-59)

TEXT: The authors studied the production of methylvinylketone (I) by condensation of industrial formalin (II) and chemically pure acetone (III). This was achieved by a vapor-phase reaction on higher oxides of rare earths, acid clays (e.g. gumbrin, kill) and industrial catalysts (e.g. Cd-Ca phosphate, Ca phosphate), performed, in a flow type latoratory apparatus at from 280 to 450-500°C (< 400°C preferable) at volume velocities from 100 to 1000-2000 l gaseous III per 1 l catalyst per hour, with 45-50 ml catalyst and a molar ratio of II: III = 1:1. The composition of the reaction mixture was determined analytically (e.g. I by Kaufman's

with a BTW-2 (VTI-2) gas analyzer. Catalysts are listed, and the Card 1/2

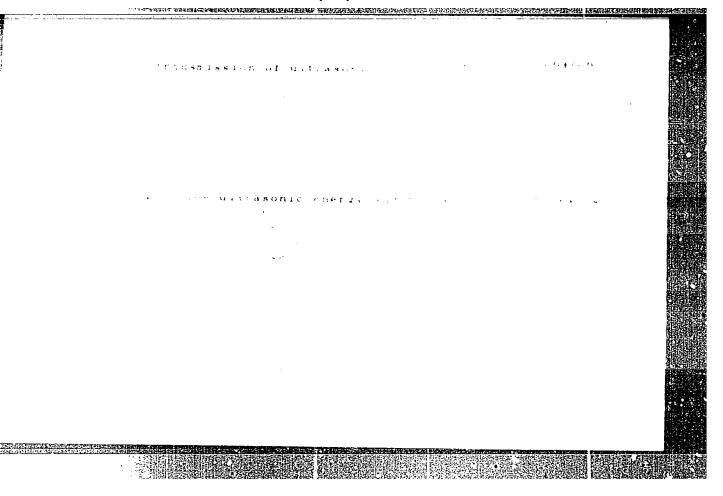
Vapor-phase condensation of ...

S/081/62/000/016/022/043 B168/B186

following respective values are given for optimum reaction temperature in °C, yield of I per throughput of III in %, yield of I per input of I into the reaction in %, productivity in g per 1 l catalyst per hr: Ca phosphate, 420, 26.6, 93.7, 306; higher exides of rare earths, 375-380, 36, 100, 325; higher exides of rare earths on a carrier, 515, -, ~100, 565; silica gel, promoted with KOH, -, 39.1, ~100, 22. Graphs are given for productivity of I depending on temperature, catalyst and volume velocity. [Abstracter's note: Complete translation.]

Card 2/2





OGAN,	Alcoholysis of glycerides as concentrates with vitamins A lation. Trudy VHIVI 6:82-87	and B obtained by	ying and enriching molecular distil- (MIRA 13:7)	
	1. Vsesoyusnyy nauchno-issled Apparaturno-mekhanicheskaya 1 (VITAMINS)	iovateliskiy vitam laboratoriya, (GLYCERIDES)	lunyy institut.	

KOGAN, M.I. [deceased]; BELYAKOVA, M.S.; SAVOST'YANOV, G.I.; KOGAN, R.M.;
RADETSKAYA, N.V.

Blochemical oxidation of d-sorbite in l-sorbose in a continuous disc-column fermenter. Trudy VNIVI 8:22-35 '61. (MIRA 14:9) (Sorbitol) (Sorbose)

KOGAN H.K. and VISHNIAKOV A.F.

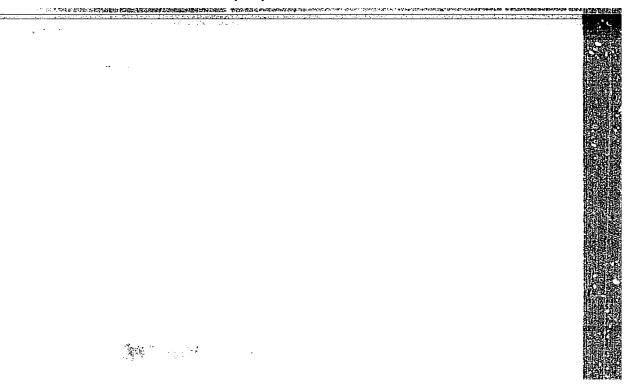
6197. Vishniakov A.P. and Kogan H.K. Leningrad Complete analytical method forr iron in blood Klinicheskaya Meditsina, Moscow 1950, 28/1 (88-90) Tables 2

Two mil of blood are charred, heated to redness, cooled, moistened with two drops of a mixture of equal parts of sulphuric and nitric acids and heated again until the residue becomen white. After cooling a drop or two of concentrated sulphuric acid is added and the whole gently heated to expel any nitrous vapors. After cooling the residue is dissolved in 20 ml. of diluted sulphuric acid (1:20) and filtered over a column of metallic cadmium. The crucible and column are washed with distilled water, filtrate and washings are combined, 1 ml. of sulphuric acid is added and the mixture titrated with 0.01 n-KMnO4. The reproducibility of the result may be checked by a second titration of the same mixture after reduction with cadmium.

Fuks - Zagreb

SO: Excerpta Medica - Section II Vol. III No. 11

Sci. Inst. Blood Inanspesion, Leningrad

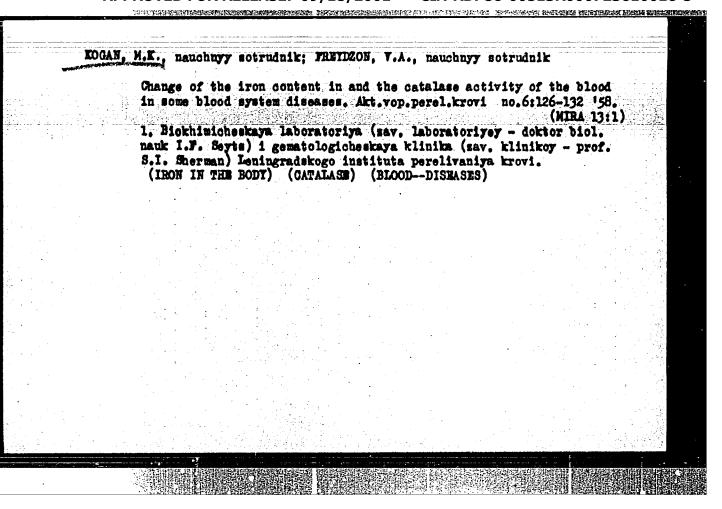


ROTTEL'D, L.S., kand.biol.nauk; ALEKSANDOVA, N.M., nauchnyy sotrudnik; KOGAN, N.K., nauchnyy sotrudnik

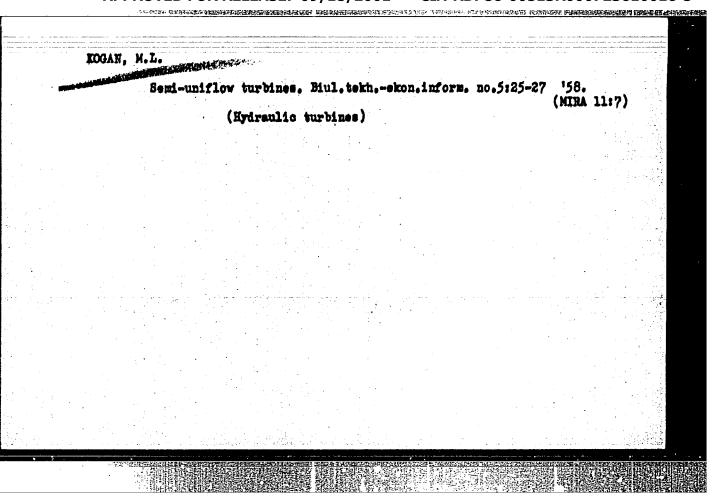
Biochemical investigation of the bone marrow and peripheral blood in blood diseases. Akt.vop.perel.krovi no.4:226-228 155.

1. Biokhimicheskaya laboratoriya Leningradskogo instituta perelivaniya krovi (sav. laboratoriyey - prof. N.N. Blokhin).
(BLOOD--EXAMINATION) (MARROW)

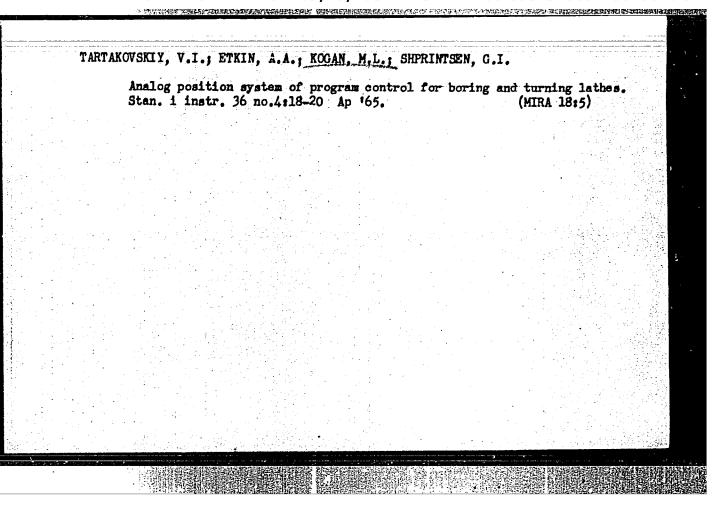
Determinations were made of total nitrogen, dry residue and mineral matter in the bone marrow and peripheral blood of healthy people and those afflicted with diseases of the blood system. In hypochromic anemia the dry residue and mineral matter were decreased in the punctate of the sternum and in peripheral blood, while total nitrogen was decreased in bone marrow. Polycythemia exhibited a disturbed ratio between total nitrogen in bone marrow and blood serum (total nitrogen was always less in bone marrow than in serum), an increase of the dry residue and mineral matter in the bone marrow, and an increase of the dry residue in the peripheral blood, while leukemia showed great fluctuation of total nitrogen content in the pum punctate.



BB/GQ EWT(d)/EWP(1) 44346-66 SOURCE CODE: UR/0115/66/000/007/0033/0038 ACC NR: AP6026946 AUTHOR: Tartakovskiy, V. I.; Kogan, M. L. ORG: none TITLE: Angle-to-voltage linear converter with an error of 0.00% SOURCE: Izmeritel naya tekhnika, no. 7, 1966, 33-38 TOPIC TAGS: electromechanica converter, angle to voltage converter, linear commute, analog computa, computar component
ABSTRACT: An electromechanical device is proposed whose output voltage (proportional to the input-shaft angle) is made up of three decimal-place voltages. The higherplace voltage is obtained from a 20-tap, 10-v, 1000-cps toroidal-core autotransformer via a shaft-driven 2-brush, 20-contact switch. The mid-place voltage, from a 24-tap toroidal-core transformer via a 2-brush, 24-contact switch. The lower-place voltage is supplied by two 900-spaced rotary transformers driven by the same shaft; these transformers perform the interpolation in the mid-place voltage steps. Thus, the input shaft drives two sets of brushes and two rotary transformers. The linearity error in an experimental model is claimed to be 0.001%; the noise (quadrature and higher-harmonic voltages) error, 0.002%. The converter is intended for analog computing devices, angle-transmission systems, and tool-feed systems of metal-[03] working machines. Orig. art. has: 3 figures and 6 formulas. SUB CODE: 49 09 /SUBM DATE: none / ORIG REF: 003 / OTH REF: 001 Cord 1/1



Kogah,	Mikheil L'vovich	
	[Budget law of the Union Republics] Biudzhetnye prava Soiusnykh Respublik. Moskva, Gos.isd-vo iurid.lit-ry, 1960. 131 p. (MIRA 14:2)	
	(MIRA 14;2)	
	(Budget)	
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A turbogenerator for nuclear power stations. Jaderna energie 3 no.8;245-248 Ag 157	KOGAN.	м.м.;	MEDONOS	, s.	(transla	tor)								
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AID P - 2558

KOGAN, M.M.

Card 1/1

Subject : USSR/Engineering

Pub. 110-a - 10/13

Author : Kogan, M. M., Kand. Tech. Sci.

Title : Problems of heat supply for small and medium size cities

Periodical: Teploenergetika, 6, 45-49, Je 1955

Abstract: The author discusses possibilities for the development and improvement of the district heating systems. A detailed analysis of utilization of existing urban electric power plants is presented. The problem of efficient

power plants is presented. The problem of efficient regional heating and types of turbines to be used is discussed. Initial and final steam characteristics are

given. Five diagrams.

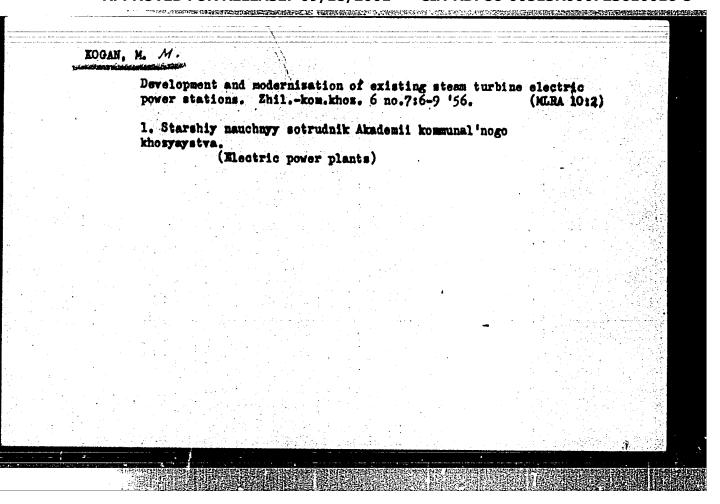
Institution: Academy of Municipal Services

Submitted : No date

KOGAN, Mikhail Mironovich, kandidat tekhnicheskikh nauk; VINOKUBOVA, Ye., redaktor; FORENRO, P., tekhnicheskiy redaktor.

[Blectric heating of small and medium sized cities] Teplofikatsiia malykh i srednikh gorodov. Moskva, Izd-vo Ministerstva kommunal'nogo khomisistva RSFER, 1956. 83 p. (MIRA 9:5)

(Heating from central stations)



AUTHOR ZITLE

KCOAN, W.N.

84-5-3/22

YER IODICAL

A Type of A Turbogenerator for Atomic Power Flants
(Tip turbogenerators dlys atomnykh elektrostantsiy -Russian)
Atomnais Energiia,1957, Vol 2, Nr 5, pp 421-426 (U.S.S.R.)
Received 6/1957
Reviewed 7/1957

ABSTRACT

For the purpose of warranting an even load of atomic condensation electric power plants both in summer and in winter it is useful for the turbines and generators in winter to work with an overload or about 5%. Condensation turbines and -generatores of the usual type are able betand such an overload, so that no special types of turbogenerators are necessary. For thermoelectric centers the selection of the type of turbogenerators is more complicated. The selection of the optimum value of Graz (this apparently denotes the degreeof utilization of the maximum thermal load of the turbines of a thermoelectric center depends upon several factors and especially upon the working coefficient of the system of energy. For most or the thermoelectric centers the optimum values of oTheZ are near 0,5. The optimum value of corner has to be higher for atomic power plants, must, however, stay below the value of 1. The optimum value of Graz may be assumed at 0,8. All further deliberations refer to the value TheT = 0,8, they are, however, also valid for the other values of the thermification coefficient. The problem of the optimum vapor parameter for atomic electricity plants has not yet been definitely solved, and therefore further investigation follows for various initial parameters of the steams lows 15 at 250°C medium: 35 ata,435°C, nigh: 90 ata, 500°C. When using turbines having a

Card 1/2

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constant steam consumption the yield of electric energy (in comparison to the usual thermofication-turbines) increases for the above mentioned parameters by 43, 32 and 24%, respectively. On the occasion of the transition to such turbines with constant steam consumption the demand of capital increases only little and the expenses for personnel do not change at ail. The joint use of turbines with constant steam consumption and of turbines with back pressure warrants the most suitable total efficiency of an atomic thermoelectric center and of a common thermal power plant. It is advisable to erect atomic power plants essentially as thermoelectric centers, by using turbogenerators with condensation. Passage of steam through the high pressure cylinder and through the low passure cylinder respectively should be constant or variable respectively. (With 5 illustrations and 1 table)

ASSOCIATION PRESENTED BY SUBMITTED

20.10.1956

AVAILABLE Card 2/2 Library of Congress

9(4)

SOV/112-58-3-4679

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1958, Nr 3, p 188 (USSR)

AUTHOR: Kogan, M. M., and Myshanskiy, Yu. V.

TITLE: Magnetic-Field Control of Phanetron Functioning in a Relaxation Circuit (Upravleniye rabotoy gazotrona v relaksatsionnoy tsepi s pomoshch'yu magnitnogo polya)

PERIODICAL: Tr. Odessk. elektrotekhn. in-ta svyazi, 1957, Nr 5 (15), pp 97-108

ABSTRACT: The staged experiments show that an external transverse magnetic field, within a certain flux-density range depending on the source voltage, materially increases the discharge-current effective value and the relaxation-oscillation amplitude; it also tends to decrease the oscillation frequency. An external longitudinal magnetic field results in stabilization of relaxation oscillations and in a certain increase in their amplitude. The authors explain the phenomena in terms of variation of parameters of the discharge gap during the conduction time; in case of the transverse field, anode current increases

Card 1/2

9(4)

SOV/112-58-3-4679

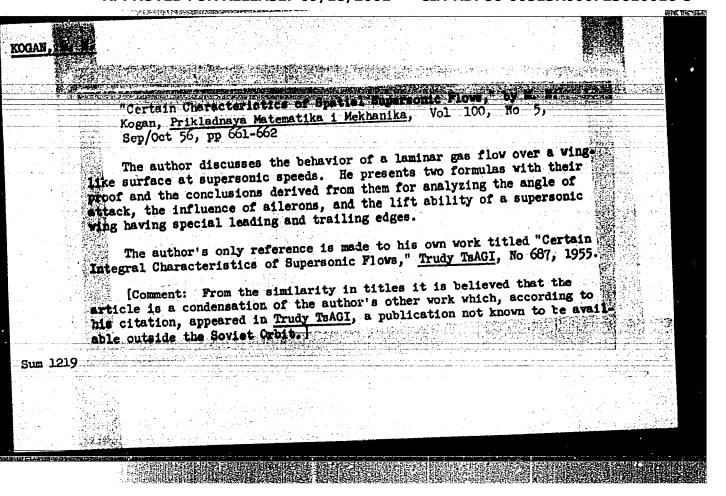
Magnetic-Field Control of Phanotron Functioning in a Relaxation Circuit

due to additional ionization by cycloidal electron motion; in case of the longitudinal field, a coordination of ionic stream motion takes place. Soviet abstractor's note: The increase in current and decrease in frequency could be explained simply by increased firing voltage of the phanotron in the magnetic field.

F.M.Ya.

Card 2/2

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CIA-RDP86-00513R000723610016-5 "APPROVED FOR RELEASE: 09/18/2001

m.N. KOGAN,

40-21-2-8/22

AUTHOR:

Kogan, M.N. (Moscow)

THE POST OF THE PROPERTY OF THE PROPERTY OF THE POST O

TITLE:

On Bodies of Minimal Resistance in a Supersonic Gas. Flow (0 telakh minimal'nogo soprotivleniya v sverkhzvukovom

PERIODICAL:

Prikladnaya Matematika i Mekhanika, 1957, Vol 21, Nr 2, Mr.-Ar.

ABSTRACT:

In connection with the linear theory the author considers the bodies and wings of minimal resistance. It is shown that in a supersonic flow there exist surfaces with the following property: On these surfaces the forces which act on the bodies being in the interior of these surfaces and the condition for the reservation of the mass can be expressed by the values of the velocity potential. This assertion permits to reduce the considered extremal problem to a plane problem. An example is considered which is analogous to the classical problem of Munk on wings in an incompressible fluid. A further simple example is computed. In all cases the author restricts himself to the calculation of the forces which act on bodies of minimal resistance; the determination of the form of body which causes these forces is not made. It is only stated that

Card 1/2

On Bodies of Minimal Resistance in a Supersonic Gas Flow 40-21-2-8/22

this problem is very difficult and that it demands the solution of the three-dimensional Goursat's problem. There are

3 references, 2 of which are Soviet, and 1 German.

SUBMITTED: August 1, 1956

AVAILABLE: Library of Congress

1. Wings-Supersonic gas flow-Theory

Card 2/2

10(2) AUTHOR:

Kogan, M.N. (Moscow)

SOV/40-22-4-1/26

TITLE:

On the Equations of Motion of Rarefied Gases (Ob uravneniyakh

dvizheniya razrezhennogo gaza)

PERIODICAL:

Prikladnaya matematika i mekhanika, 1958, Vol 22, Nr 4, Ji.-Ag. pp 425 - 432 (USSR)

ABSTRACT:

The Navier-Stokes equations applied in aerodynamics are valid rigorously for such flows only, the characteristic longitudinal dimensions of which are large compared with the mean free length of path of the molecules. For strongly rarefied gases or for flows around obstacles with extremely small measurements the flowing medium must not at all be treated as a continuous spectrum. For the investigation of motion of rarefied gases the kinetic gas theory applies the distribution function of the velocities in a certain volume. This distribution function is normalized so that its integral over a certain volume represents the number of the molecules which move with a certain velocity. Thus it is possible to express the hydrodynamic magnitudes density, mean molecular velocity, temperature, pressure by the distribution function. The stress tensor and also the vector of the energy flow in the flow then result as moments of the

Card 1/3

On the Equations of Motion of Rarefied Gases

SOV/40-22-4-1/26

distribution function. The distribution function itself has to satisfy the Boltzmann equation. This very complicated equation is simplified in the present paper so that it is possible to calculate from it the distribution function in possible to calculate from it the distribution function in arbitrary approximation. According to the method given by arbitrary approximation. According to the applied series expansion can be calculated in every concrete case and thus the pansion can be calculated in every concrete case and thus the error of the approximative calculation for weakly rarefied gases can be determined. The Boltzmann equation simplified by the author has the form :

(2.7)
$$\frac{df}{dt} = \frac{\partial f}{\partial t} + \frac{\partial f}{\partial x_i} = An(f_0 - f)$$

Here f is the distribution function, n the number of the molecules in the unit volume, A a constant depending on the kind of the investigated molecules.

The given reduced Boltzmann equation is applied to the investigation of motions of weakly rarefied gases, and some vestigations concerning the motions of strongly rarefied gases are made. Since in the motions of strongly rarefied

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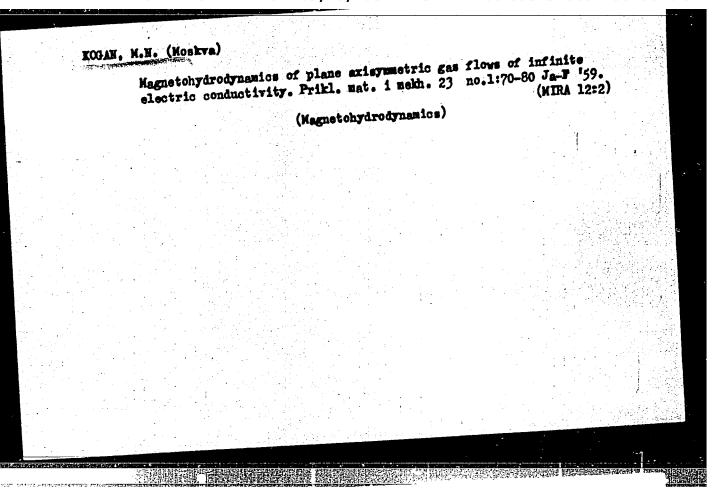
On the Equations of Motion of Rarefied Gases

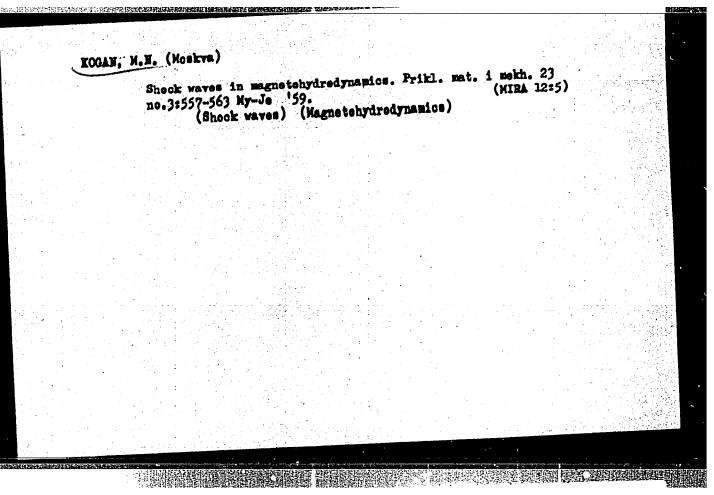
Sov/40-22-4-1/26

gases the impacts of the molecules have an unessential influence only, therefore it may be supposed that the neglects made in the deduction of the reduced Boltzmann equation are admissible. In any case, however, the simplified Boltzmann equation can be understood to be a mathematical model of the exact Boltzmann equation, and one can study on it the behavior of the distribution function.

There are 4 figures; and 5 non-Soviet references, all of which are English.

SUBMITTED: May 28, 1957





807/20-128-3-15/58 10(7), 24(8) Kogan, M. N. AUTHOR: On Flows of High Thermal Conductivity TITLE: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 3, pp 488-490 PERIODICAL: (USSR) Thermal conductivity of ionized gas rapidly increases due to the high mobility of electrons. Hence, Prandtl number Pr of such gases can attain values of ~10°2 (with liquid metals, ABSTRACT: Prandtl number is of the order 10-3). In a plasma of high temperaturet, conductivity rises also due to radiations. This article deals with some characteristic kinds of flows occurring at high conductivity of the gas. Part I is devoted to the thermal boundary layer. For steady gas flow, the equation of thermal conductivity reads (in the usual denotation); $\sigma_{pQ} \left(u \frac{\partial T}{\partial x} + v \frac{\partial T}{\partial y} \right) = u \frac{\partial p}{\partial x} + v \frac{\partial p}{\partial y} + \frac{\partial}{\partial x} \binom{k}{k}$ When Pr is small and Reynolds number so great that also Peolet number Card 1/4

507/20-128-3-15/58 On Flows of High Thermal Conductivity is much greater than i, the boundary layer resulting from the flow of gas about a plane plate may be subdivided into two boundary layers: into a viscous one with a thickness of = L/ \sqrt{Re} , and a thermal one with a thickness of δ_k = L/ \sqrt{Pe} , where $\delta_{\mu} \ll \delta_{k}$ holds. The temperature transverse to the viscous layer may be regarded as constant and equal to the wall temperature. The effect of viscosity may be neglected in the thermal layer. The flows in the thermal layer are defined $\frac{\partial x}{\partial u} + \frac{\partial y}{\partial v} = 0, \quad \partial u \frac{\partial x}{\partial x} + \partial x \frac{\partial x}{\partial x} = -\frac{\partial x}{\partial x},$ by the equations $c_p Q \left(u \frac{\partial T}{\partial x} + v \frac{\partial T}{\partial y} \right) = u \frac{\partial p}{\partial x} + \frac{\partial}{\partial y} \left(k \frac{\partial T}{\partial y} \right)$. The boundary conditions $u \rightarrow u_{\infty}(x)$, $T \rightarrow T_{\infty}(x)$ at $y \rightarrow \infty$, and v = 0, $T = T_{w}(x)$ at y = 0 are added to this set. The solution of this set determines the velocity at the boundary of the viscous boundary layer u(x;0), which is required for a calculation of the viscous flow (at a density which is a given function of p and T_). The author solves the simplest problem for the constants p, u_{∞} , To and Tw. He further determines the heat transfer to the wall, Card 2/4

In Flows of High Thermal Conductivity

807/20-128-3-15/58

taking kinetic heating in a viscous layer into account. At the ratio of thermal conductivity to viscosity under investigation, the flow in the viscous layer may be considered isothermal and, consequently, also incompressible. On the other hand, heat is emitted when the gas in the viscous layer is slowed down, which is then transferred to the wall and thermal layer. The total amount of heat emitted per unit of length of the viscous layer is

 $q = -\frac{1}{2} \frac{d}{dx} \int_{0}^{\infty} e^{u(u^2 - u_{\infty}^2)} dy$. Part II deals with the flow at

very high thermal conductivity. With rising thermal conductivity (with decreasing Peclet number), the notion of thermal layer becomes less important, and the flow outside the viscous layer is determined by the entire common set of equations for the dynamics of gases for a heat-conducting, yet not viscous gas. At very high - but still finite - thermal conductivity, heat transfer is primarily determined by thermal conductivity. Within infinite ranges also convective transfer is to be taken info account. The author exemplifies the problem of the circulation about a plate parallel to the flow, and the

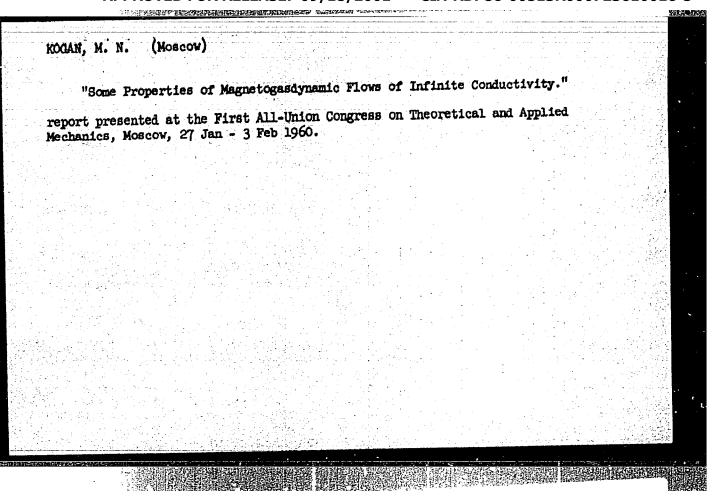
Card 3/4

On Flows of High Thermal Conductivity SOV/20-128-3-15/58

PRESENTED: May 21, 1959, by A. A. Dorndnitsyn, Academician

SUBMITTED: May 15, 1959

Card 4/4



"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723610016-5

5/179/60/000/03/023/039 E031/E413

10.2000 A

Kogan, M.N. (Moscow)

AUTHOR:

On Shock Waves in Magnetic Hydrodynamics

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, Nr 3,

pp 143-146 (USSR)

ABSTRACT:

In the investigation of plane stationary flows, it is convenient to use the hodograph plane. In Ref 2 and 3 were constructed the characteristic manifolds in this plane and in Ref 4 shock polars were constructed for flows with parallel field and velocity vectors. shock polars were obtained from the conditions of conservation of mass, impulse and energy of the flow and increase of entropy. Those regimes from the above are found which are stable in accordance with stability conditions which are quoted from Ref 1. Some consideration leads to support for the opinion that fast shock waves are always stable. In the range of Mach number investigated, fast shock waves satisfy the stability conditions. It is shown that instability occurs where the parameters of the flow ahead of the wave correspond on the basis of

Card 1/2

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On Shock Waves in Magnetic Hydrodynamics

the conservation equations to two or more possible regimes of flow behind the wave. Next the shock wave in a viscous, heat and electricity conducting gas is considered. The heat transfer equation is used to evaluate the thickness of the wave. In the plane case the thickness increases as the intensity diminishes but increases as the intensity diminishes but increases as the intensity increases. There are in fact wave is a significant parameter. There are 3 figures and 4 Soviet references.

SUBMITTED: February 24, 1960

Card 2/2

77986 16.7600 SOV/40-24-1-14/28 AUTHOR: Kogan, M. N. (Moscow) Plane Flows of an Infinitely Conducting Perfect Gas in a Magnetic Field Not Parallel to the Gas Velocity TITLE: Prikladnaya matematika i mekhanika, 1960, Vol 24, Nr 1, pp 100-110 (USSR) PERIODICAL: An analysis and classification of plane magnetohydro-dynamic flows is given based on the linearized equations: $\rho_0\left(\frac{\partial u}{\partial x}+\frac{\partial u}{\partial y}\right)+V_0\frac{\partial \rho}{\partial x}=0$ ABSTRACT: $\frac{\partial H_y}{\partial x} + \frac{\partial H_y}{\partial y} = 0 \tag{1.2}$ $V_0 \frac{\partial u}{\partial x} = -\frac{1}{p} \frac{\partial p}{\partial x} + \frac{H_{u_0}}{4\pi p_0} \left(\frac{\partial H_x}{\partial y} - \frac{\partial H_y}{\partial x} \right)$ $V_0 \frac{\partial r}{\partial x} = -\frac{1}{\rho_0} \frac{\partial \rho}{\partial y} + \frac{II_{x_*}}{4\pi \rho_0} \left(\frac{\partial II_y}{\partial x} - \frac{\partial II_x}{\partial y} \right)$ $V_0 H_0 + H_{y_0} u - v H_{x_0} = 0, \qquad p = \frac{v p_0}{p_0} \rho$ Card 1/4

Plane Flows of an Infinitely Conducting Perfect Gas in a Magnetic Field Not Parallel to the Gas Velocity

77986 SOV/40-24-1-14/28

for an ideal infinitely conducting gas in a magnetic field H_o perpendicular to the incoming stream. The analysis extends the results of a prior paper (Priklad. matem. 1 mekh., 1959, Vol 23, Nr 1) in which the magnetic field was taken parallel to the incoming stream. Here, the symbols without zero subscript denote small perturbations in the corresponding quantities at infinity denoted by a zero subscript. Vols speed of the incoming stream; O, density; p, pressure; H, magnetic field; (u,v), velocity. It makes use or formulas giving

speed of the incoming stream; ρ , density; p, pressure; H, magnetic field; (u,v), velocity. It makes use of formulas giving the inclination (relative to the incoming stream) of shocks of zero intensity derived in the above paper. The author notes that the inclination for arbitrary orientation of H and V can be obtained by a suitable choice of a moving coordinate system. Another distinction is that for H_0 parallel to V_0 (as in ordinary gasdynamics) the field within the body did not

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Plane Flows of an Infinitely Conducting Perfect Gas in a Magnetic Field Not Parallel to the Gas Velocity

77986 sov/40-24-1-14/28

influence the flow. Here, the field within cannot be neglected. The field cannot have jumps on the wall, since the resulting currents would imply the existence of a tangential force for an ideal fluid. For hyperbolic flow about a profile (wedge or plate) under zero angle of attack with no magnetic sources in the body, it is shown that a pressure change and turning of the stream occurs in two successive compression shocks or rarefaction waves. It is also shown that an elliptic-hyperbolic flow can develop into two parts: one elliptically damped and the other hyperbolically damped at infinity. Next, the author considers the case when there are body currents perpendicular to the plane of flow. The character of the currents flowing about a plate is discussed (the conducting layer is assumed to be insulated from the stream). In this case, the stream passes through a shock which strongly compresses the gas, after which the gas expands somewhat in a rarefaction wave. When the current gives rise to a transverse component of the magnetic field, the perturbations generated by the

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S/040/60/024/02/24/032

AUTHOR: Kogan, M. N. (Moscow)

TITLE: On the Uniqueness of the Quasi-hyperbolic Flows of Magnetic Hydrodynamics

PERIODICAL: Prikladnaya matematika i mekhanika, 1960, Vol. 24, No. 2, pp. 370-371

TEXT: The author shows that the hyperbolic subsonic flow constructed by him in his former paper (Ref. 1) (during the flow towards a thin body by an ideal gas? with infinite conductivity in presence of a magnetic field which is parallel with the flow velocity) is the only possible one. In this connection he refers to wrong results in (Ref. 4). The author thanks A. G. Kulikovskiy, G. A. Lyubimov, L. J. Sedov and V. V. Sychev for discussions.

There are 2 figures, and 5 references: 2 Soviet, 2 American and 1 French. SUBMITTED: January 6. 1960

Card 1/1

KOGAN, M.H. (Moskva)	
Propagation of perturbations in plane magnetohydr flows. Prikl.mat.i mekh. 24 no.3:530-536 My-Je'60	odynamic •
(Magnetohydrodynamics)	(HIRA 13:10)

10.2000 (4)

21(7)AUTHOR:

Kogan, M.N.

SOV/20-130-2-11/69

TITLE:

On the Plane Flow of an Infinite-conducting Fluid With Almost

Parallel Vectors of the Magnetic Field and Velocity

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 2, pp 284-286

(USSR)

ABSTRACT:

If $\vec{H} \neq \vec{V}$ holds for a plane flow at infinity, these vectors are not parallel in the entire flow because $[\vec{V}, \vec{H}]$ const does not hold in the entire flow. $\vec{V}_i \vec{H} = \vec{U}_{\infty} \vec{H}_{y\infty}$ holds at the boundary of a body (which has no magnetic field sources) about which the above-mentioned fluid flows. V, denotes the tangential component of the velocity vector and H the normal component of the field strength. v_{∞} is the velocity of the flow running along the x-axis, and Hyo is the component of the magnetic field along the y-axis. The afore-mentioned equation leads to two conclusions: 1) $H_n \neq 0$ on the surface of the body. Consequently, there are no surface currents on the surface of the dielectric.

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On the Plane Flow of an Infinite-conducting Fluid With SOV/20-130-2-11/69 Almost Parallel Vectors of the Magnetic Field and Velocity

2) Hy $\rightarrow \infty$ holds for the approach toward the critical point $(V_t \rightarrow 0)$. The author investigated a new type of a boundary layer that is connected with the first of the afore-mentioned conclusions. It occurs on the surface of the bodies with almost parallel velocity vector and field vector (i.e., with small $\xi = \frac{1}{1000} \frac{1}$

following equations:
$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0$$
, $\frac{\partial H}{\partial x} + \frac{\partial H}{\partial y} = 0$, $u \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 0$

$$= -\frac{1}{\varrho} \frac{\partial p}{\partial x} + \frac{H_y}{4\pi\varrho} \left[\frac{\partial H_x}{\partial y} - \frac{\partial H_y}{\partial x} \right] , u \frac{\partial v}{\partial x} + v \frac{\partial v}{\partial y} = -\frac{1}{\varrho} \frac{\partial p}{\partial y} + \frac{\partial H_y}{\partial y} + \frac{H_x}{4\pi\varrho} \left[\frac{\partial H_y}{\partial x} - \frac{\partial H_x}{\partial y} \right] , u \frac{\partial v}{\partial x} + v \frac{\partial v}{\partial y} = -\frac{1}{\varrho} \frac{\partial p}{\partial y} + \frac{\partial H_y}{\partial y} + \frac{\partial H_y}{\partial y} \right] , u \frac{\partial v}{\partial x} - v \frac{\partial v}{\partial y} = -\frac{1}{\varrho} \frac{\partial p}{\partial y} + \frac{\partial v}{\partial y} = 0$$

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On the Plane Flow of an Infinite-conducting Fluid With SOV/20-130-2-11/69 Almost Parallel Vectors of the Magnetic Field and Velocity

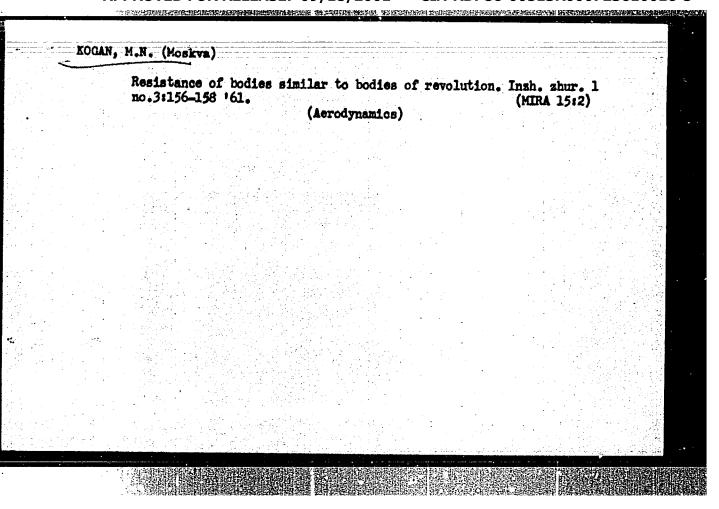
constant in a transverse position to the layer. The authors then proceed to independent variables, and the computation is followed step by step. With $v = \partial \phi/\partial \chi$ and $H_y = -\partial \phi/\partial \psi$ one obtains $u \frac{\partial \phi}{\partial \psi} + h_x \frac{\partial \phi}{\partial \chi} = -H_{y\varpi} U_{\varpi}$. The solution of this equation is not very difficult after the determination of u and H_x . With the help of the formulas $d_x = \frac{1}{H_y \varpi} \frac{1}{U_y \varpi} \left(v d \chi - H_y d \psi \right)$ it is possible to proceed to the physical surface. $d\psi = -\frac{1}{H_0(x)} dx$ holds along the boundary line $\chi = \cos x$. Ho denotes the function value obtained from the solution of the outer problem. Over a wide region of the boundary layer it is possible to determine $H_0(x)$ and $u_0(x)$ with sufficient accuracy from the solution for $\xi = 0$. Therefore, this region requires a special investigation. There are 1 figure and 2 Soviet references. July 9, 1959, by A.A. Dorodnitsyn, Academician

PRESENTED:

SUBMITTED: Card 3/3 June 30, 1959

KOGAN, M. N.

Doc Phys-Math Sci - (diss) "Magnetohydrodynamic courses of ideal gas with unlimited electrical conductivity." /Moscow/, 1962. 6 pp; (State Committee of the Council of Ministers USSR for Aviation Techniques, Central Aero-hydrodynamic Inst imeni Prof N. Ye. Zhukovskiy); number of copies not given; price not given; (KL, 7-61 sup, 217)



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\$/040/61/025/001/014/022 B125/B204

26.2311

Kogan, M. N. (Moscow)

TITLE:

The magnetohydrodynamic flows of mixed type

PERIODICAL: Prikladnaya matematika i mekhanika, v. 25, no.1, 1961, 132-137

TEXT: The present paper shows that in magnetohydrodynamics, several types of mixed flows exist. These flows may be described either by the equation by Tricomi $\psi_{yy} - y\psi_{xx} = 0$ as well as by the equation $\psi_{xx} - y\psi_{yy} = 0$ differing from the former considerably. In the present paper, various types of mixed flows are studied, and for each of them, the corresponding equations and similarity rules are derived. If the flow has the same direction as the x-axis, then the following equations of the magnetohydrodynamics of an ideal gas are obtained:

 $(1 - M^2) \frac{\partial V_x}{\partial x} + \frac{\partial V_y}{\partial y} = 0, \left[M^2(1 + N^2) - H^2\right] \frac{\partial V_x}{\partial y} - (M^2 - N^2) \frac{\partial V_y}{\partial x} = 0$ (1.5)

These equations change their type if only one of the coefficients passes

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The magnetchydrodynamic flows of ...

through zero. This holds also with M = 1, M = N, and $M = N 1 + N^2$. The character of the transition M = 1 and M = N is different according to wether N > 1 or N < 1 holds. Also the case M = N = 1 is of interest. The author discusses these six cases. $N^2/M^2 = (N^2/M^2)_0 (\rho/\rho_0)$ holds, where $(N^2/M^2)_0$ is the limit of the ratio N^2/M^2 where $N \to 0$ and ρ_0 denote the limiting density. With $(N^2/M^2)_0 < 1$ only the transition at M = 1 and N < 1 is possible. This transition is qualitatively similar to the soundnear transition of classical hydrodynamics, which has been studied in the papers by F. I. Frankl', S. V. Fal'kovich, Guderley and other authors. New types of mixed flows may occur only with $(N^2/M^2)_0 > 1$, i.e. in the case of high magnetic energy density. The quantities marked by an asterisk relate to points with M = 1, quantities with two asterisks to points with $M = N/\sqrt{1 + N^2}$, quantities with the index of points with M = N, in which the velocity equals Alfven velocity: $V = V^0$. The second section of the present paper deals with the flow near the line $M = M_{**}$. Here,

The magnetohydrodynamic flows of ...

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 $V_{x} = V_{**}(1 + u)$ and $V_{y} = V_{**}v$ is put, where u and v are small quantities. By some substitutions and, using a Legendre transformation, for this case the equation $V_{y} = V_{y}v = 0$ is obtained. With 0 = 0 all characteristics are real, and the equations are hyperbolic. The boundary lines of the flow may occur in the hyperbolic case. As a simple example, a flow of the mixed type, which is under investigation, is calculated. Further, the similarity law for the investigated flows is given. For the Alfvèn-like flows, one finds in the same manner $V_{yy} - V_{y}V_{xx} = 0$, $V_{yy} - V_{y}V_{xx} = 0$, and for the sound-near velocities $u \left[(X + 1)v_{yy} - v_{yu} \right] + v_{yy} = 0$ holds. The flows of mixed type investigated here may occur under the following conditions: 1) With $(N^2/M^2)_0 < 1$ there is only one region of mixed flows near the sound line in the nozzle. This flow is qualitatively similar to the sound-near flows of ordinary gas dynamics. 2) With $(N^2/M^2)_0 < v_{y}/v_{y}$, there exist, in addition to the sound-near transition of the ordinary Card 3/4

The magnetohydrodynamic flows of ...

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type also the transitions already investigated in parts 2 and 3 at $M = N/\sqrt{1 + N^2}$ and M = N, which bound the hyperbolic subsonic range.

3) With $(N^2/M^2)_0 > Q_0/Q_*$, the hyperbolic subsonic range extends from $M = N/\sqrt{1 + N^2}$ up to the sound line, where the transition to the elliptic supersonic flow occurs. The elliptic supersonic range ends at the Alfvèn-near transition to the hyperbolic flow. 4) With $(N^2/M^2)_0 = Q_0/Q_*$ the transition from the elliptic to the hyperbolic flow occurs at $M = N\sqrt{1 + N^2} < 1$. All flows at high velocities are hyperbolic with a parabolic degeneration on the sound line. There are 5 figures and

SUBMITTED: September 14, 1960

1 Soviet-bloc reference.

Card 4/4

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S/040/61/025/002/019/022 D201/D302

AUTHOR:

Kogan, M.N. (Moscow)

TITLE:

On spatial magneto-hydrodynamic flow

PERIODICAL: Prikladnaya matematika i mekhanika, v. 25, no. 2, 1961, 375 - 376

TEXT: In this article the case of two surfaces of hyperbolic flow are considered. The linearized equations for an ideal infinitely conducting gas with a magnetic field parallel to the field velocity have the form

$$(1 - M^2) \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z} = 0 \qquad \left(M = \frac{V_0}{a_0} \right)$$

$$[M^2 - N^3 (1 - M^3)] \frac{\partial v_x}{\partial y} - (M^2 - N^2) \frac{\partial v_y}{\partial x} = 0 \qquad \left(N = \frac{V_a}{a_0} \right)$$

$$[M^2 - N^2 (1 - M^3)] \frac{\partial v_x}{\partial z} - (M^2 - N^2) \frac{\partial v_z}{\partial x} = 0 \qquad \left(V_a = \frac{H_0}{\sqrt{4\pi\rho}} \right)$$

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where v_x , v_y , v_z are the perturbed velocities, v_0 the flow velocity, v_0 Al'fven's velocity, v_0 the unperturbed magnetic field and v_0 the density. For the perturbed field

$$\frac{h_z}{H_0} = (1 - M^4) \frac{v_z}{V_0}, \quad \frac{h_y}{H_0} = \frac{v_y}{V_0}, \quad \frac{h_z}{H_0} = \frac{v_z}{V_0}$$
 (2)

Transforming by means of

$$v_{x} = \frac{M^{4} - N^{4}}{M^{3} - N^{3}(1 - M^{3})} v_{x}, \quad v_{y} = -v_{y}, \quad v_{z} = -v_{z},$$

$$v_{x} = -v_{x}, \quad v_{y} = v_{y}, \quad v_{z} = -v_{z},$$

$$v_{z} = -v_{z}, \quad v_{z} = -v_{z},$$

gives

$$\frac{\partial v_y^-}{\partial s^-} - \frac{\partial v_s^-}{\partial y^-} = \left(\frac{\partial v_s}{\partial y} - \frac{\partial v_y}{\partial s}\right) = \frac{V_\theta}{H_0} \left(\frac{\partial h_z}{\partial y} - \frac{\partial h_y}{\partial s}\right) = F\left(y, s\right)$$

where in the general case $F(y, t) \neq 0$. From a consideration of these equations, the author deduces that in the quasihyperbolic

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On spatial magneto-hydrodynamic flow

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case with vortex motion, the problem cannot be treated within the framework of the theory of an ideal gas. In conclusion the author thanks A.A. Doroshintsin, and V.V. Sychev for their help. There are 1 figure and 1 Soviet-bloc reference.

SUBMITTED: January 2, 1961

X

Card 3/3

24.6750

= 25473 | 8/020/61/139/001/005/018 B104/B231

AUTHOR:

Kogan, M. N.

TITLE:

Conservation of vortices and currents in magnetohydrodynamics

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 1, 1961, 58 - 59

TEXT: It is known that the conservation theorems on hydrodynamics established by Thomson are not applicable to magnetohydrodynamics. Here is furnished proof of a statement that has an analogous meaning in magnetohydrodynamics as have the above theorems in the field of hydrodynamics. Subject of investigation is the Tlow of an incompressible infinitely well conductive liquid. It is assumed that the liquid disturbances are minimal, that is, the quantities V - V and H - H and

their derivatives are small, so that the squares of these quantities can be neglected. \vec{V} and \vec{H} stand for the flow vector and magnetic field vector, respectively. The subscript zero refers to the undisturbed flow. Introducing the Alfvèn-velocity $\vec{A} = \vec{H}/\sqrt{4\pi o}$, an arbitrary contour moving either at the velocity $\vec{V}_0 + \vec{A}_0$ or $\vec{V}_0 - \vec{A}_0$ is examined. The following theorem can

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Conservation of vortices and ...

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be formulated for this contour: in a weakly disturbed incompressible liquid exhibiting an infinite conductivity the circulation of the vector \overrightarrow{V} + \overrightarrow{A} over an arbitrary contour moving at the velocity \overrightarrow{V}_0 + \overrightarrow{A}_0 will be constant. This theorem is verified as follows: for a contour moving at the velocity $\overrightarrow{V}_0 - \overrightarrow{A}_0$:

$$\frac{d}{dl} \oint (V + A, dr) = \oint \left(\frac{d}{dl} (V + A), dr\right) \left(\frac{d}{dl} = \frac{\partial}{\partial l} + (V_0 - A_0, \nabla)\right). \tag{1}$$

is valid. Upon introducing the Alfvèn velocity the motion and induction equations can be put down as follows:

$$\frac{\partial V}{\partial i} + (V_0, \nabla) V = -\operatorname{grad}\left(\frac{\rho}{\rho} + \frac{A^2}{2}\right) + (A_0, \nabla) A, \tag{2}$$

$$\frac{\partial A}{\partial i} + (V_0, \nabla) A = (A_0, \nabla) V, \tag{3}$$

$$\frac{\partial A}{\partial I} + (V_0, \nabla) A = (A_0, \nabla) V, \tag{3}$$

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Conservation of vortices and ..

By addition one has

$$\cdot \frac{d(V+A)}{dl} = -\operatorname{grad}\left(\frac{p}{p} + \frac{A^3}{2}\right).$$

(4)

By substituting (4) into (1) it is shown that the theorem is correct with $\overline{V}_0 - \overline{A}_0$. An expression

$$\frac{d(\mathbf{V}-\mathbf{A})}{dt} = -\operatorname{grad}\left(\frac{p}{\rho} + \frac{\mathbf{A}^2}{2}\right) \left(\frac{d}{dt} = \frac{\partial}{\partial t} + (\mathbf{V}_0 + \mathbf{A}_0, \nabla)\right). \tag{5}$$

analogous to (4) is obtained which proves the theorem for a contour moving at the velocity $\overrightarrow{V}_0 + \overrightarrow{A}_0$ to be correct. This result can also be represented in another form. Applying the curl operator to (4) and (5)

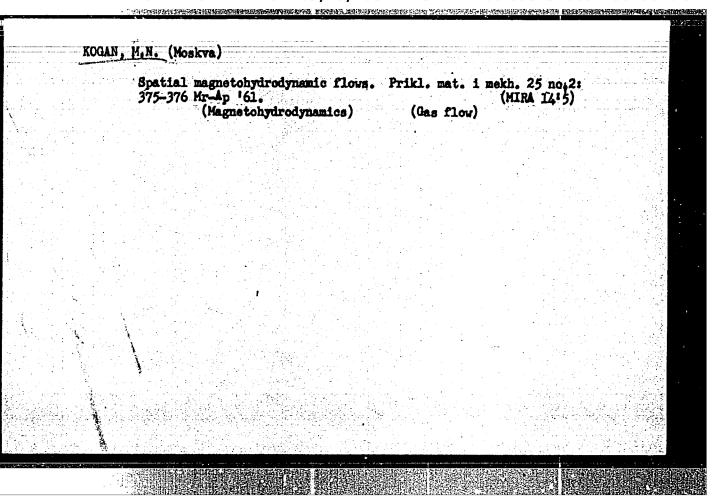
$$\frac{\partial \vec{\omega}_1}{\partial t} + (\mathbf{V}_0 - \mathbf{A}_0, \nabla) \vec{\omega}_1 = 0, \quad \frac{\partial \vec{\omega}_2}{\partial t} + (\mathbf{V}_0 + \mathbf{A}_0, \nabla) \vec{\omega}_2 = 0, \tag{6}$$

Card 3/4

Conservation of vortices and ... is obtained, where $\vec{\omega_1}$ = curl $(\vec{V}+\vec{A})$ and $\vec{\omega_2}$ = curl $(\vec{V}-\vec{A})$. From this can be seen that in magnetohydrodynamics ourl (V+A) moves relatively to the liquid at the velocity $-\tilde{A}_0$ and curl $(\tilde{V}-\tilde{A})$ at the velocity \tilde{A}_0 relatively to the liquid. Contrary to hydrodynamics there are thus two possible displacement directions for vortices. The result offers an explanation of the mechanism of formation of tracks and vortex rings which originate with the motion of a body in a liquid. To include, the motion of a body in a viscous liquid of a finite conductivity is investigated. It is evident that the vortices originating around the body will move in the above mentioned directions. Viscosity and conductivity of the liquid, however, will change these directions in a way demonstrated in Fig. 1. There are 1 figure and 1 non-Soviet-bloc reference. The reference to the English-language publication reads as follows: H. Yosinobou, J. Phys. Soc. Japan, 15, no. 1, (1960) February 23, 1961, by A. A. Dorodnitsyn, Academician PRESENTED: SUBMITTED: February 23, 1961 Card 4/4

Mixed magnetohydr 137 Ja-F '61.	odynamic flows.	Prikl. mat. 1	mekh. 25 no.1:132 (MIRA 14:6)	
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	Simple exact solution of equations in magnetohydrozhur. 1 no.2:152-154 61. (Magnetohydrodynamics)	xlynamics. Inzh (MIRA 14:12)
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KOGAN, M.N. Conservation of vortices and currents in magnetohydrodynamics. Dokl. AN SSSR 139 no.1:58-59 Jl *61. (MIRA 14:7) 1. Fredstavleno akademikom A.A. Dorodnitsynym. (Magnetohydrodynamics) (Vortex motion)

38091 8/040/62/026/003/014/020 D407/D301

10.3100 AUTHOR:

Kogan, M.N. (Moscow)

TITLE:

On hypersonic flow of a rarefied gas

PERIODICAL: Prikladnaya matematika i mekhanika, v. 26, no. 3,

1962, 520 - 529

TEXT: Hypersonic flow, close to free-molecule flow, is considered. The presence of molecular processes was established, which permit calculating the flow, taking into account the first intermolecular collisions only (even if one of the characteristic lengths is much smaller than the linear size of the body). It is shown that under contain conditions of large Powerlds numbers a thin molecular bour smaller than the linear size of the body). It is shown that under certain conditions, at large Reynolds numbers, a thin molecular boundary-layer is formed near a plate which is at zero (or small) angle of attack. In general, the effective collision cross-section of molecules of decreases with increasing relative velocity co. In order to cules of decreases with increasing relative velocity co. In order to cules the dependence of of on co, two characteristic cases are illustrate the dependence of of on co, two characteristic cases are considered: of a const., and of is inversely proportional to the relative velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Hypersonic flow past a plate with characteristic tive velocity. Card 1/.4

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On hypersonic flow of a rarefied gas

pendicular to the flow. The mean velocity of the reflected molecules is determined by the temperature of the wall T_W and the accomodation coefficient α . In this case, the principal dimensionless flow-parameter is the ratio $M_2 = V_{\infty}/V_2$ (V_{∞} denoting the velocity of the oncoming flow and V_2 the mean velocity of the reflected molecules). It is assumed that $M_2\gg 1$ and $\sigma=\sigma_{\infty}={\rm const.}$ In order to obtain the first correction to free-molecule flow, it is sufficient to make allowance for the first collisions only. Denoting by N_{-} , P_{-} and Q_{-} , the decrease in the number of particles, momentum and energy, due to the collisions, one obtains

 $N_{-} \sim N_{0} n_{2} dL \sim N_{0} M_{2} K^{-1}, P_{-} \sim N_{-} m V_{\infty}, Q_{-} \sim N_{-} m V_{\infty}^{2},$ (3.4)

where K is Knudsen's number. Further, it is assumed that σ is inversely proportional to the relative velocity, while (as before) M2=1. Then, the cases: M2 ~1, σ = const., and M2 ~1, σ inversely proportional to the velocity are considered. It was found that, depending on the conditions the similitude criteria change: from K/M (in the case M2 >> 1, σ = const.) to MK (in the last case, i.e. by M2 times. The boundary of free-molecule flow shifts in accordance with these Card 2/4

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On hypersonic flow of a rarefied gas criteria: in the first case, free-molecule flow is realized (at same Mach number) at much greater altitude than in the last case (M2 \sim 1, o' inversely proportional to the velocity). Further, hypersonic flow past a plate at zero angle of attack is considered. It was found that the density of the molecules in the boundary layer increases until the leakage at the ends of the layer compensates the inflow of molecules. The calculation of hypersonic flow past_a plate, at Knudsen numbers from $K\gg M$ to $K^2\gg M\gg K$ (from $R\gg 1$ to $\sqrt{M}\gg R\gg 1$), can be performed with allowance for the first intermolecular collisions, regardless of whether one of the characteristic lengths λ is commensurate or even much smaller than the characteristic dimension of the body. At even larger Reynolds numbers, it is necessary to take into account the second, third, etc. collisions. The process of "conversion" of reflected molecules into molecules with large free-path, was established. It was observed that the curve of drag and heat transfer as a function of K, has a maximum. The drag (heat-transfer) is, at an angle of attack $\vartheta=90^\circ$ smaller than, and at zero angle of attack, larger than, in the case of free-molecule flow. Further, hypersonic flow past a plate at arbitrary angle of attack, is considered, as well as flow past a cone. In both cases it was found that,

On hypersonic flow of a rarefied gas S/040/62/026/003/014/020 D407/D301

at small angles of attack, the drag is larger than in the case of free-molecule flow.

SUBMITTED: February 26, 1962

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1:4

\$/020/62/144/006/008/015 B108/B102 AUTHOR: Kogan, M. N. TITLE: Reversibility theorem for a nearly free molecular current PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 6, 1962, 1255-1257 TEXT: The effect of interaction between molecules incident upon and reflected from an arbitrary plate and the number of particles, energy and momentum falling upon this plate is considered. All characteristic mean free paths of the molecules are assumed to be greater than the characteristic size of the plate. The distribution both of the incident and of the reflected particles near the plate can then be regarded as in free molecular beam. The change in the k-th property of the beam owing to collision of the particles can be described by a function $\vec{y}_{ij}^k(x_i-x_j,y_i-y_j)$ such that the entire change in this property is ds, ds, to be integrated over the whole plate. Card :1/2

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Reversibility theorem for a...

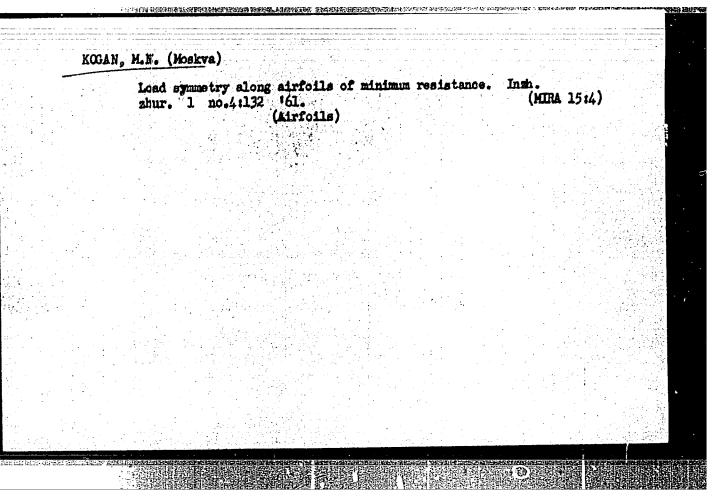
for the reflected beam in which number of particles, energy and momentum have to be conserved. Only the first collisions of the particles need be considered. These features have an effect on the aerodynamic characteristics of the plate. There is 1 figure.

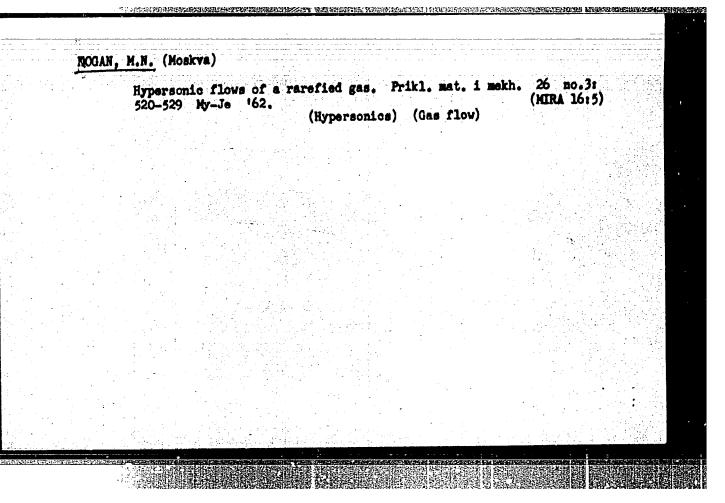
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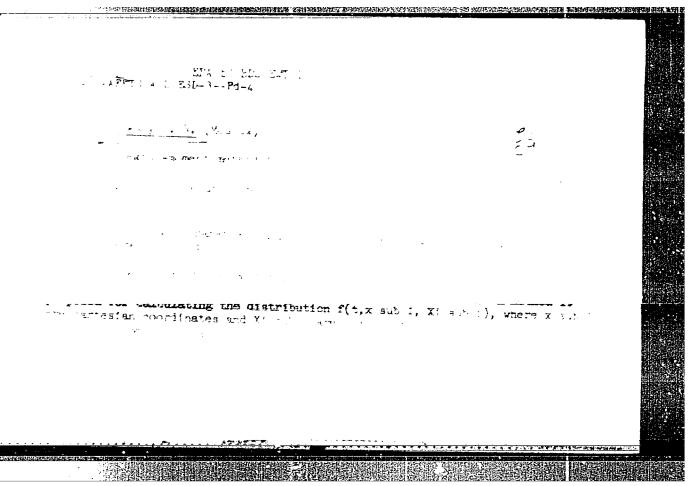
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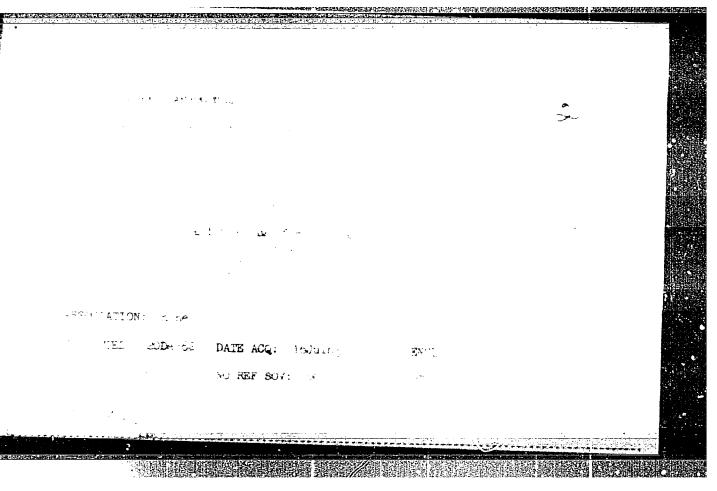
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	Reversibility theorem for nearly free-molecular flows. SSSR: 144 no.6:1255-1257 Je '62.	Dokl. AN (MIRA 15:6)
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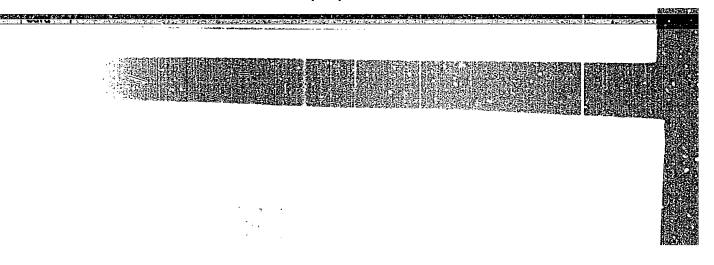


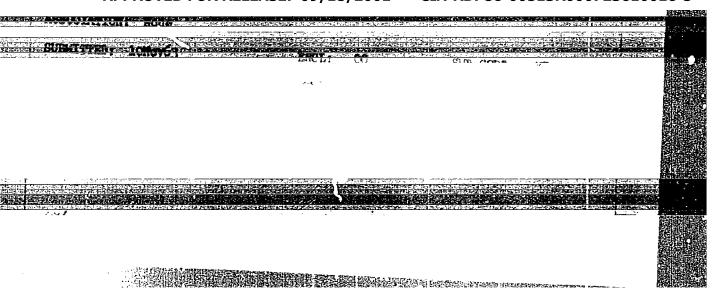






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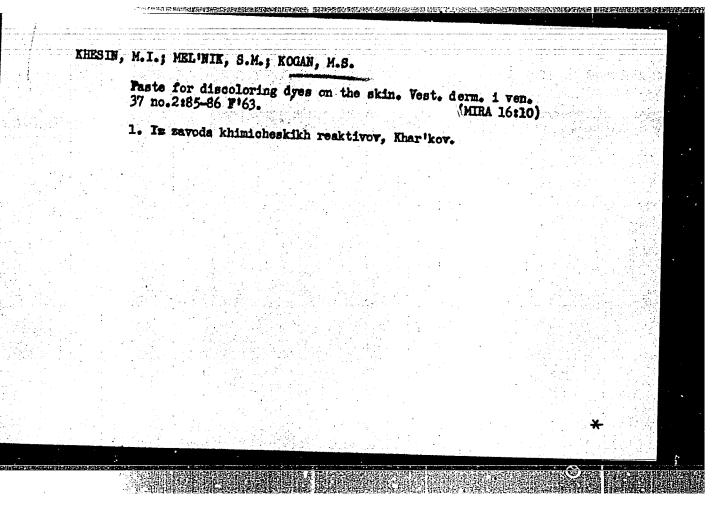


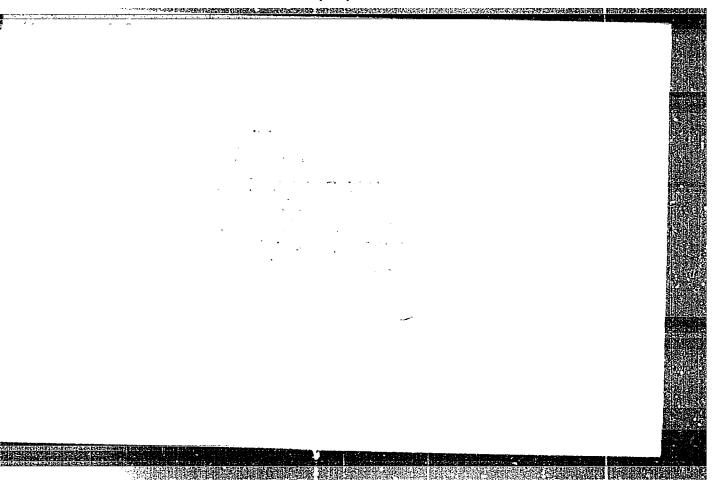
CHEBOTAREV, D. N., KOGAN, M. O. Engs.

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Monthly List of Russian Accessions, Library of Congress, September 1952. UNCLASSIFIED.





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AUTHORS:

Blokh, G. A., Kogan, M. S., SOV/153-58-6-18/22 Bogdanovich, N. A., Bol'shakova, Z. H.

Tyuremnova, Z. D.

TITLE:

On the Stability in Water of the Petroleum and Benzene-

resistant Rubbers (Ob ustoychivosti k vode maslobensostoykikh

PERIODICAL:

Izvestiya vysehikh uchebnykh zavedeniy. Khimiya i

khimicheskaya tekhnologiya, 1958, Nr 6, pp 101-107 (USSR)

ABSTRACT:

The rubbers mentioned in the title get into contact as well with water at normal and at raised temperatures under operational conditions beside the substances to which they are resistant. A particular shortcoming of the rubber products for special use (butadiene nitryl- and chloroprene rubber) in operation is their low stability in water. They swell up to 3-5% at normal temperatures and up to 7-9% at 100°. In consequence of this water penetrates e.g. into cables. In the present investigation the action of the following factors upon the stability in water of the rubbers mentioned in the title was investigated: a) vulcanization conditions (duration, temperature), b) substitution of the hydrophilic components

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